

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 1 086 981 A1

(12)

**EUROPEAN PATENT APPLICATION**

published in accordance with Art. 158(3) EPC

(43) Date of publication:

28.03.2001 Bulletin 2001/13

(51) Int. Cl.<sup>7</sup>: C08J 7/04, B32B 9/00

(21) Application number: 99913656.7

(86) International application number:

PCT/JP99/01989

(22) Date of filing: 13.04.1999

(87) International publication number:

WO 99/52973 (21.10.1999 Gazette 1999/42)

(84) Designated Contracting States:

DE FR GB IT NL

(30) Priority: 15.04.1998 JP 12183588

12.04.1999 JP 10452399

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**(54) GAS-BARRIER FILMS**

(57) The present invention provides a gas-barrier film which is produced through applying a layer containing a metallic compound to a surface of a processed-polymer layer produced from a mixture of a polyalcohol and at least one poly(meth)acrylic polymer selected from the group consisting of poly(meth)acrylic acids and partially neutralized poly(meth)acrylic acids. The invention also provides a laminated gas-barrier film containing the aforementioned gas-barrier film either surface of which is laminated on with a plastic film. The gas-barrier film exhibits excellent gas-barrier properties and can be produced through a simple, convenient process.

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Table 6

	Oxygen Permeability		Water resistance	Ra ( $\mu\text{m}$ )		Existence ratio of metal compound
	Pre*8	Post*9		AFM	TEM	
Ex. 51	0.3	0.1	O	0.003	0.02	1.58
Ex. 52	0.8	4.0	O	0.003	0.02	2.60
Ex. 53	0.2	0.2	O	0.003	0.02	2.50
Ex. 54	0.4	0.9	O	0.004	0.02	1.58
Ex. 55	0.5	1.0	O	0.004	0.02	1.56
Ex. 56	0.3	1.0	O	0.003	0.02	1.66
Ex. 57	0.3	1.0	O	0.003	0.02	1.58
Ex. 58	<0.1	<0.1	O	0.003	0.02	1.58
Comp. Ex. 11	13	50	O	-	-	0
Comp. Ex. 12	1.0	14	O	-	-	0
Comp. Ex. 13	0.5	20	O	-	-	0
Comp. Ex. 14	0.9	40	O	-	-	0
Comp. Ex. 15	3.5	14	O	-	-	0
Comp. Ex. 16	40	100	O	-	-	0
Comp. Ex. 17	1.0	14	O	-	-	0
Comp. Ex. 18	0.4	15	O	-	-	0
Comp. Ex. 19	122	140	O	-	-	0
Comp. Ex. 20	77	130	O	-	-	0
Comp. Ex. 21	30	110	O	-	-	0
Comp. Ex. 22	6.2	47	O	0.003	0.02	0
Comp. Ex. 23	5.9	47	O	0.015	0.06	0
Comp. Ex. 24	1.0	14	O	0.015	0.02	0
Comp. Ex. 25	1.0	14	O	0.001	0.0004	0

Pre\*8): Measurement before reflow treatment

Post\*9): Measurement after reflow treatment

#### Industrial Applicability

[0123] When a metallic compound is applied to a polymer layer, the produced film exhibits excellent gas-barrier properties. Application of a metallic compound is carried out through a simple, convenient, and inexpensive process as compared with the deposition process. When a polymer layer is heat-treated, water resistance is imparted to the layer, and thus a gas-barrier film exhibiting water resistance and excellent oxygen gas-barrier properties can be produced, and the gas barrier properties of the film are not impaired through washing with water.

#### Claims

1. A gas-barrier film which is produced through applying a layer containing a metallic compound onto a surface of a polymer layer produced from a mixture of a polyalcohol and at least one poly(meth)acrylic acid polymer selected from the group consisting of poly(meth)acrylic acids and partially neutralized poly(meth)acrylic acids.

2. A gas-barrier film according to claim 1, wherein the surface of the polymer layer to which the metallic-compound-containing layer is not applied is fixed onto a surface of a substrate.
3. A gas-barrier film according to claim 1, wherein at least the polymer layer is subjected to heat treatment.
4. A gas-barrier film according to claim 1, wherein the metallic compound is at least one species selected from the group consisting of magnesium oxide, calcium oxide, zinc oxide, magnesium hydroxide, calcium hydroxide, and zinc hydroxide.
5. A gas-barrier film according to claim 1, wherein the metallic-compound-containing layer is produced from a mixture of the metallic compound and a resin.
6. A gas-barrier film according to claim 5, wherein the film is used for sterilization treatment.
7. A laminated gas-barrier film comprising a gas-barrier film according to any one of claims 1 through 6, wherein a plastic film is laminated on either surface of the gas-barrier film.